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ABSTRACT

This paper examines certain of the cues to surface constituency that are salient to children in the comprehension of syntactic structure. Accessibility is studied through a set of experiments requiring seven-year-old children to repeat certain syntactic constituents. These children can correctly identify subjects and also predicate phrases with surprising accuracy, but their performance appears to depend heavily on prosodic cues, as indicated by the poorer success of children in identifying single pronoun subjects and subjects of senterces with misleading intonation contours. It is argued that duration (phrase-final lengthening) is an especially important cue in children's comprehension of structure and that children may be more heavily dependent on prosodic cues as signals of syntactic structure than are adults. Finally, it is suggested that children's reliance on prosodic cues may relate to the difficulty that many beginning readers have in comprehending what they read (even when they can identify the individual words in a written sentence), since prosodic cues are not systematically preserved in written language. (Author)

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Technical Report No. 466

WHY SHORT SUBJECTS ARE HARDER TO FIND THAN LONG ONES

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by

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Report from the Project on
Studies in Language: Reading and Communication

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Abstract

This paper examines certain of the cues to surface constituency that are salient to children in the comprehension of syntactic structure. Accessibility is studied through a set of experiments requiring seven year old children to repeat certain syntactic constituents. These children can correctly identify subjects and also predicate phrases with surprising accuracy, but their performance appears to depend heavily on prosodic cues, as indicated by the poorer success of children in identifying single pronoun subjects and subjects of sentences with misleading intonation contours. It is argued, that duration (phrase-final lengthening) is an especially important cue in children's comprehension of structure and that children may be more heavily dependent on prosodic cues as signals of syntactic structure than are adults. Finally, it is suggested that children's reliance on prosodic cues may relate to the difficulty that many beginning readers have in comprehending what they read (even when they can identify the individual words in a written sentence) since prosodic cues are not systematically preserved in written language.

The Problem

Like other investigators of the comprehension process, we assume that the listener must assign a tentative surface structure to utterances, as a basic and probably early step in the comprehension process. That is, the listener must decide what the major phrases of the sentence are, what the heads of these phrases are, and what modifies what. Clark and Clark (1977, pp. 57-72) review the evidence for seven strategies which may partially constitute this "syntactic construction process," and virtually every other commentator that we know of has proposed processes with similar outcomes (Fodor, Bever, & Garrett, 1974; Kimball, 1973; Massaro, 1975). Indeed, it is difficult to think of alternatives, models of comprehension which do not involve a preliminary surface parsing. The surface structure of sentences indicates relationships which appear to be necessary for deeper analysis.

Our interest is in which of the cues to surface constituency are salient to children and adults. Two possible cues, certainly, are the grammatical form class to which a particular word belongs, and the affixes which help to identify this form-class membership. Bever (1970), for instance, formulates some perceptual strategies based in part on recognizing sequences such as noun-verb-noun, while Clark and Clark mention the identification of function words, the anticipation of appropriate content words, the use of affixes, and the anticipation of structure appropriate to the verb among the strategies which the evidence to date supports.

Similarly, Garrett (1978) has surveyed the role of the function word/content word distinction in both production and comprehension.

Each of these suggestions implies that in the process of comprehension, a listener must determine the syntactic categorization of lexical items. The account seems to be that as we listen to strings of speech sounds, we try to identify familiar lexical items. Then, for each item, or at least most items, we consult our mental lexicon to determine whether the item is a function or content word, whether it is a noun or a verb, and if a verb or a function word, what syntactic structures it is likely to be associated with.

We do not doubt that this account is partly, perhaps even largely correct. Certainly there is good evidence that listeners anticipate the syntactic structure associated with particular verbs, for example. Since this information is idiosyncratic and not predictable from the verb's phonetic shape or any other superficial property, some analog of consulting a mental lexicon must be a part of the comprehension process. On the other hand, we wish to present briefly some reasons why lexical consultation is likely to be inefficient, especially for children, and then some experimental evidence that children may indeed rely on other cues to a greater extent than adults.

Identifying form-class membership, even with the aid of diagnostic affixes such as the plural or progressive, is a somewhat uncertain matter in English, and must be especially so for children. English regularly uses homophones as both nouns and verbs; indeed a great many of the high-frequency words in the language are of this sort, such as fly, walk, work, hold, and match. The situation is further complicated by the fact that inflectional affixes which might indicate form-class membership are themselves often ambiguous. Plural or possessive endings,

which might help to identify nouns, for example, are homophonous with the third-person singular affix on verbs; thus matches is still ambiguous. Likewise, even the -ing form which signals a main verb in the progressive aspect is homophonous with the ending that appears on present participles and gerunds.

As if to make the comprehension of English still more difficult, this form-class ambiguity is productively extended in coinages and jargon. Thus, creations like phase-out, print-out, or rip-off regularly spread from nouns to verbs or vice-versa. It would seem that if there is great value in marking unambiguously the basic distinction between nouns and verbs, one could do a better job of it than we have in the development of English.

In the case of children especially, one must add to these considerations the effect of encounters with new vocabulary. Estimations of vocabulary size are admittedly uncertain at best, being entirely dependent on one's notion of "lexical entry" and criterion of knowledge, but surely any estimate of a high school graduate's vocabulary must exceed 10,000 items, which implies that the learner has acquired considerably more than one item per day of life. In short, children's comprehension strategies, and to some extent those of adults, must tolerate a fairly substantial chance of encountering familiar words used in an atypical grammatical function or encountering unfamiliar words, hence words of initially unknown grammatical category. A listener can usually resolve such uncertainties in context; we do not often become aware of form-class ambiguity, for instance. This fact indicates that in parsing, the listener uses additional cues, supplementing the recognition of lexical items and affixes.

The Task

In order to study the accessibility of various surface constituents and the salience of particular cues, we have developed a paradigm in which a listener is trained to repeat a particular constituent of presented sentences. The training uses no grammatical terminology. In that the technique requires the listener to manipulate the sentence in a way that is not typical of ordinary comprehension, we admit that it does not tap comprehension directly. It is perhaps best seen as a "metalinguistic" task, having certain properties in common with the interpretation of difficult utterances (Gleitman & Gleitman 1970), judgments of syntactic structure (Levelt, 1970), or judgments of well-formedness (deVilliers & deVilliers, 1972; Gleitman, Gleitman, & Shipley, 1972). In particular, like these other metalinguistic tasks, our elicits considerable individual variation in performance. However, our task requires no normative evaluation and a minimum of explicit awareness of structure. It even mirrors an ordinary performance such as repeating a constituent for confirmation or correction. We think it provides one kind of evidence for the salience of certain cues and the accessibility of certain constituents of sentences.

Our experiment appears as a game called "Walrus and Alligator." We took the name and adapted the procedure from Langendoen (1970) who suggested a similar procedure to demonstrate that speakers follow linguistic rules in forming tag questions. In our version, the subject (a child, let us suppose) sits down at a table with two adults, one named Walrus and the other named Alligator. Walrus is to say a

sentence of English, and Alligator's task is to "repeat back a special part of that sentence." The adult Alligator demonstrates, and then the child is permitted to play Alligator. Besides providing the sentences, Walrus gives consistent feedback: He tells Alligator whether Alligator has repeated the "right part" of the sentence, and if not, Walrus repeats the right part. In our experiments Walrus and the adult Alligator demonstrated with 5 sentences, and then the young Alligator played the game with a sequence of, typically, 15 sentences. Thus we were able to study the course of learning, the subject's ultimate success in picking out the target constituent, and the nature of the subject's errors. Into this basic scheme we introduced certain variations appropriate to the experiment, as reported below.

The Subjects

The children in our experiments were 7-year-olds from McFarland (Wis.) Elementary School. McFarland is a community of 2,400 with children from a mixture of social classes, representing suburban/exurban and rural backgrounds. Our linguistic adults were paid undergraduate volunteers from the University of Wisconsin-Madison. Clearly, the children and adults differ in respects other than age; the adults represent a population socially and academically selected for university attendance. Gleitman and Gleitman (1970), among others, have shown that this kind of selection can strongly affect metalinguistic performance. Accordingly, the best we can say is that we have two groups which differ most strikingly in age, but which probably differ in other relevant respects as well.

The Results

Subjects and Predicates

First we found that children (and adults) can be trained to repeat the subject noun phrase, even though the children lacked any training in grammatical analysis and had no name in mind for that constituent. (To a surprising extent, the adults, too, lacked both the training and the name.) For the subject noun phrase, our results are displayed in Table 1.

Table 1

Seven-Year-Olds Learning to Repeat Subject Phrases and Predicates of Varied Length and Type.

	% of Children Correct on		% Correct Overall	n
	≥ 8 of 15 Trials	≥ 4 Trials in a Row		
Subject	69	69	57	13
Predicate	71	64	49	14

The adults were tested in a somewhat different way; they repeated noun phrases only en route, as it were, to dealing with more difficult cases to be described below. Nonetheless, 100% (26) of our adults reached our criterion of correctly repeating four subject noun phrases in a row. Most (81%) did so on their first four tries after the demonstration. Thus, most children and all adults reached criterion and correctly repeated most of the subject noun phrases in the sentences presented.

In these instances, the subject noun phrases were deliberately varied in length, complexity, animacy, position of the head noun, and in what kind of word followed the subject noun phrase (e.g., an auxiliary, a main verb, or an adverb). No strategy that we can think of, other than identifying the subject noun phrase itself, would have led to consistent success, nor does it appear that the children or adults were trying to apply any such strategy: of repeating all the words up to the first auxiliary, for instance.

An additional indication that children can learn to identify major constituents is that they succeeded in picking out predicate phrases or verb phrases. (Only 3 of these 14 children had participated in the experiment with subject noun phrases 3 weeks earlier.) Again, we varied the predicate phrases in structure and length: They began with be (progressive), have (perfect), a modal, or a main verb, and they ranged from three to six words in length. The results, summarized in the second column of Table 1, are quite comparable to those for the subject noun phrase. The children repeated 49% of the predicates or verb phrases correctly, and 10 children (71%) answered more than half of the sentences correctly. The similarity between the subject and the predicate results seems not surprising, because in all of our sentences, the two were complements: The predicate phrase consisted of everything that followed the subject noun phrase. However, there is some evidence that children may not have simply chosen the complement of the subject noun phrase in order to identify the predicate.

One such bit of evidence is that children tended to repeat the verb phrase, rather than the full predicate phrase, even though Walrus

insisted on the latter in giving praise and feedback. That is, the children tended to omit any auxiliary preceding the main verb in the nine sentences which contained surface auxiliaries. The high level of success reported above is true only if one accepts either the verb phrase only or the full predicate phrase as correct. The children actually repeated the full predicate on just 30% of the trials overall, and on 39% of the trials for the six sentences with no auxiliary. These results can be explained either in terms of the integrity of the verb phrase as a psychological constituent, or in terms of stress: The main verb was the first stressed word with a full vowel, in the predicate phrase. This latter interpretation is consistent with the hypothesis that children simply chose whatever followed the subject phrase as the predicate, only if one is willing to assume that they then forgot the initial unstressed words. An additional respect in which the subject and predicate strategies appeared to differ is reported below (p. 15).

Accepting the more generous interpretation of "correct" in this experiment, it is interesting that the results are comparable to those of the subject phrase experiment, for the two have somewhat different requirements. When the target is the subject phrase, one need not listen to the remainder of the sentence at all once one is certain of having identified the target. When the target is the predicate, however, one must listen to the entire sentence, in order to identify the beginning of the predicate and then to remember it. On the other hand, the length of time during which one must remember the target, having identified it, differs in the opposite direction.

Nonconstituents

To place the success with subject noun phrases in perspective, it is important to consider the same task where the target was a nonconstituent of similar length and position in the sentence. We attempted to train children to repeat just the first four words or the first four syllables, for instance. The results are presented in Table 2. Though it is difficult to say what constitutes chance performance on this task, it seems unlikely that the children were more successful than one would expect if they were simply repeating a random portion of the beginning of the sentence. No child succeeded with any consistency. Admittedly, this result is unsurprising, because in our attempt to create a nonconstituent, we required the child to count words or syllables, a thoroughly counter-intuitive requirement, perhaps.

Table 2

Seven-year-olds Learning to Repeat the First Four Words or the First Four Syllables of Sentences.

	% of Children Correct on		% Correct Overall	n
	≥ 8 of 15 Trials	≥ 4 Trials in a Row		
Four Words	0	0	19	11
Four Syllables	0	0	20	8

Next, then, we defined a nonconstituent in terms of a constituent: The task was to repeat the last word of the subject noun phrase and the word which followed it, i.e., the first word of the predicate. Thus whatever cues the children relied on to identify the subject phrase, plus the ability to identify a single word, would suffice for this task, and yet the target was a nonconstituent. This experiment we carried out identically with both children and adults; Table 3 presents the results.

Table 3

Seven-year-olds and Adults Learning to Repeat the Last Word of the Subject Noun Phrase and the First Word of the Predicate.

	% of Listeners Who Repeated Correctly		% Correct Overall	n
	≥ 9 of 18 Items	≥ 4 in a Row		
Children	0	0	10	6
Adults	83	70	70	23

Note that we did this with very few children (n = 6) as a matter of mercy; they were lost and hated the task. Clearly, neither adults nor children identified the nonconstituent as well as the subject noun phrase, even though the two were closely related. The children failed to do better than chance, certainly, while the adults varied considerably, from one-third to all correct. The individual variation that is typical of difficult metalinguistic performances showed up in this task of recognizing a nonconstituent. Thus it seems fair to conclude that the subject noun phrase is much more accessible than a comparable nonconstituent.

This conclusion, while fair, is still unsurprising. It supports the widespread conviction that major surface constituents are, in various senses, psychologically real and available; it does not show that these constituents play a role in comprehension, however. It is notable that the subject noun phrase is marked in multiple ways: It is both a syntactic and a semantic unit, ordinarily. In the sentences that we used, the last word of the subject noun phrase was always a noun, either the head noun or the object of a preposition. This noun was sometimes marked by a plural affix. Moreover, a subject noun phrase of more than one word is usually marked off by a characteristic prosodic contour to be discussed below.

Single-word Subjects

There was, however, one surprise: While children succeeded in identifying subject noun phrases of from two to six words in length, they utterly failed with single-word subjects. There were 2 sentences with pronominal subjects in our original list of 20 sentences for the subject noun phrase experiment. (In order to discount the effects of these single-word subjects and possible fatigue effects, we have reported only the results from the first 15 sentences above.) Of 13 children, none correctly repeated either of the pronominal subjects. Recognizing this tendency, we substituted one sentence with a single-word lexical-noun subject into our list. Of the eight children who tried it, none succeeded with this sentence either. This failure with both pronominal and nominal single-word subjects suggests that prosody may be a major cue to the identification of subject noun phrases in this experiment; single-word subjects are typically not marked prosodically, as multiple-

word phrases are, but are part of a phonological phrase which includes the main verb.

To evaluate this suggestion, we undertook two further experiments, one to examine the difficulty with single-word subjects more closely and the other to test for an effect of prosody. In both studies, we first presented varied multiple-word subjects of the sort which we had found to be relatively easy for children. When a child had successfully repeated four subject noun phrases in a row, we switched to a new list containing either single-word subjects or misleading prosody (to be described below). In that way, we established the concept of repeating the subject noun phrase, and then observed the effect of one-word subjects and of prosody. Both of these involved much larger numbers of children, as well. No child who participated in this second pair of experiments had taken part in the earlier ones.

The single-word subject condition confirmed that 7-year-olds can generally identify multiple-word subject noun phrases in this task. Sixty-four percent (25 out of 39) of the children reached our criterion, correctly repeating four multiple-word subject phrases in a row within the first 10 trials. With those who met this criterion, we continued with 13 additional sentences, 9 of them having single-word subjects of various types. The four multiple-word subjects were mixed in to discourage a strategy of simply repeating the first word, and as a check on whether children were in fact adopting such a strategy.

Basically, the single-word subjects indeed proved more difficult, but children could partially overcome this difficulty: They repeated 40% of them correctly overall. At the same time, they continued to

succeed with the multiple-word subjects, (69% right), so that they were not merely repeating just the first word regardless of structure. The presence of an explicit noun-like inflection proved to be irrelevant. With marked plurals (four instances) children got 48% correct; with noncount, hence unmarked, nouns (three instances) they got 55% correct.

One type of single-word subject continued to pose seemingly insuperable difficulty, however, namely pronouns. In attempting to identify the two pronouns among our nine single-word subjects, children were right just 4 times out of 50 tries. Thus the overall 40% correct figure is misleading; children correctly identified single-word nouns 49% of the time, while they identified pronouns just 8% of the time. Nor is this effect attributable to the syllabic structure of pronouns: Excluding the pronouns, there is no difference between monosyllabic and polysyllabic one-word subjects (49% and 48% correct, respectively).

In sum, then, the single-word subjects were indeed somewhat more difficult than the multiple-word ones, but most of that difficulty occurred with the first such subject, understandably, and with the two pronouns, not-so-understandably. However, when one excludes these three troublesome items, the difference between single-word and multiple-word subjects is still statistically significant [$\chi^2(1) = 6.12$, $p < .05$]. The difficulty with pronouns cannot be attributed to their lack of noun-like inflections or to their monosyllabic structure, since these factors did not otherwise influence our results. In fact, except for the three difficult cases, the success rate with single-word subjects of different types is remarkably uniform. Table 4 lists the single-word subjects and the percentage of children who correctly identified them. We are inclined to attribute the difficulty of pronouns not only to their comparative

lack of semantic content, which renders them "transparent," more like function words, but also to the complete lack of stress and other supra-segmental marking on pronouns. Supporting the importance of low-level phonetic properties are the results with one particular sentence: Because of the cluster of consonants [(stsk)] at the subject/predicate boundary in "Ghosts come out after dark," we tended to stress and articulate this word especially carefully. This turned out to be by far the easiest of the single-word subjects (80% correct).

Table 4

Single-word Subjects in Order of Presentation:

Percent of 7-year-olds Correctly Repeating (n = 25).

Subject	% Correct
Toys	24
Soup	48
We	3
Elephants	52
Soap	56
He	12
People	48
Ghosts	80
Bees	36

We replicated the single-word subject experiment with our linguistic adults (n = 14). One can barely discern a similar pattern, in that toys,

the first single-word subject, and we were the most difficult, but the variance is so greatly reduced overall that there are no significant differences. The undergraduates got an average of 11.85 of our 13 mixed single-word and multiple-word subjects correct.

In the light of the difficulty with pronominal subjects, let us re-examine the question of whether there may be a difference between children's strategies for identifying the subject phrase and those for the predicate phrase. In the predicate phrase experiment, 5 of our 15 sentences had pronouns as subjects. Children were no worse in identifying the predicate phrases of these sentences than of the others, which had subject phrases two and three words long. Indeed, they were (nonsignificantly) better; the mean number correct was 7.2 versus 6.6. Since entirely comparable groups of children were very poor at identifying pronominal subjects in two other experiments, we conclude that the children probably did not identify the predicate phrase as the complement of the subject, or indeed vice-versa.

But does the difficulty of single-word subjects simply reflect a difficulty in identifying a word? On a small scale, we tested whether children of this age have difficulty in identifying a first word regardless of its syntactic function. With five children, 6 1/2 to 7 years old, we played Walrus/Alligator, using simply the first word as target. The sentences were those of our original subject phrase experiment, with minor changes to eliminate the repetition of certain first words, such as "the." None of the children had participated in any previous experiment.

Every child exceeded our criteria for success; the mean number correct was 14.6 out of 20 trials, with an average of 9.2 in a row correct.

Interestingly, every child identified the two pronominal subjects correctly, even though these were the same words in the same sentences and the same position in the sequence as in our subject phrase experiment. Thus, first words and pronouns in particular are difficult for children to identify only when the task is to identify a constituent; the difficulty does not inhere in one word per se. This distinction would be predicted if children rely heavily on prosodic cues in identifying the constituent; they could not use such cues to identify single words in general, and would have to rely on lexical recognition. [Also interestingly, the children did not need to be aware of the notion "first word" in order to succeed; four of the five could not name the unit after they had completed the game. Nevertheless, they must have inferred from the demonstration that the target was a single word, for on no trial (total = 100) did any child produce more than one word.]

Misleading Prosody

To test for an effect of prosody somewhat more directly, we conducted a final experiment, using sentences which had misleading prosodic contours near the subject/predicate boundary. Again we introduced our putatively difficult cases after children had produced four correct repetitions in a row with ordinary (multiple-word) subject noun phrases. Again, most 7-year-olds reached this criterion: 71% (25/35). The misleading sentences were tape-recorded, in order to control prosody; consequently, we presented the demonstration and the initial (reach criterion) sentences on tape as well. As in the single-word condition, there were 13 test sentences after a child reached criterion, nine of them having a misleading prosodic contour and the other four having

multiple-word subjects and normal prosody.

We constructed the misleading stimuli by tape-splicing. For example, we recorded normal pronunciations of the following sentences:

(a) Your neighbors shovel their sidewalk carefully.

(b) Your neighbors' shovel got lost in the snow.

We then spliced the underlined portion of (b) in place of the underlined portion of (a). The result is a recorded sentence (without extraneous noises from the splice, etc.) in which the prosodic contour appropriate to a subject noun phrase falls, misleadingly, on "Your neighbors shovel." Specifically, the prosodic break appropriate to the last word of the subject noun phrase actually occurs on "shovel," the main verb. The resulting pattern, though subtle, is noticeably abnormal.

Other stimuli are misleading in the opposite way: The prosodic contour terminates before the end of the real subject noun phrase. Thus we spliced normal recordings of sentences (c) and (d),

(c) Our dog's bark sometimes frightens people.

(d) Our dogs bark at the neighborhood cats.

replacing the underlined portion of (c) with the underlined portion of (d). Thus in this case, the first contour appropriate to a subject noun phrase occurs on "our dog's," which is not the complete subject phrase.

A third subtype of misleading stimuli also has the prosodic contour terminating before the end of the real subject noun phrase, but in these cases, the misleadingly marked pseudo-phrase can not be a subject noun phrase syntactically. For example, we spliced the underlined portion of (f) into the underlined position of (e):

(e) When they are wild, animals are brave.

(f) Trainers of wild animals are brave.

Thus the pseudo-phrase "Trainers of wild" has a contour (including a noticeable pause) which would normally be appropriate to a syntactic constituent.

With all three types, we were interested in whether the prosody would affect children's (and adults') responses on the Walrus and Alligator task, whether children could overcome any misleading effects, and whether mistakes would tend to follow the prosodic contour. Basically, we found a very large effect of prosody: The 7-year-olds (n = 25) got only 30% of the sentences with false contours correct, while continuing to perform at a high level with the four normal sentences (83% correct). Moreover, 78% of the errors followed the misleading contour, i.e., the child's repetition ended where the prosodic phrase ended in the stimulus.

Children were somewhat more likely to repeat incorrectly when the prosodic break came before the head noun (83% wrong) than when it came later (56% wrong), suggesting an interaction of syntactic and prosodic cues. That is, when children had already encountered a syntactically plausible subject phrase, they were somewhat less likely to be misled by prosody. On the other hand, children were just as likely to make an error when the prosodically marked pseudo-constituent could not have been a noun phrase (e.g., "Trainers of wild") as they were in the four comparable cases in which it could have been (e.g., "Our dog's"). However, this observation does not mean that the children were making no use of syntactic or lexical information; that they were following

prosody wherever it led. For one thing, both "cold" and "wild," at the pseudo-boundaries, can be used as nouns; they exemplify the ambiguity of lexical categorization in English. Moreover, the children in fact followed prosody less frequently when it marked off a sequence that would not ordinarily be a noun phrase; they made errors just as often, but those errors matched the falsely marked sequence less frequently (55% vs. 77%). Finally, children did grow somewhat better at ignoring the misleading contour: With the first three sentences, they were right only 26% of the time; with the last three, they succeeded 48% of the time.

Our adult listeners (n = 12) were far less affected by the misleading contour though it had an effect. While the adults were nearly perfect in identifying ordinary multiple-word subjects and single-word subjects after the first item or two, they were misled by prosody 18% of the time. The adults were certainly more aware of the misleading prosodic contour.

The Prosodic Cue(s)

In summary, we observed that children have much greater difficulty than adults in learning to pick out single-word noun phrase subjects, even though they are relatively successful in identifying multiple-word phrases. In addition, they have greater difficulty in ignoring the misleading contour which we created by grafting the prosodic pattern appropriate to one structure onto another. These two observations are consistent with our hypothesis that children rely more heavily on prosodic cues than do adults, even when other cues, such as lexical category membership, are more appropriate.

What might these prosodic cues be, specifically? Of the possibilities, namely stress, pitch, duration, and pause, one's first candidate must be duration. Investigators such as Martin (1970) and Klatt (1975) have shown that segments tend to be substantially longer when they immediately precede major constituent boundaries. Klatt (1976) reviews syntactic effects on duration, specifically including the subject-predicate boundary. Also, several experiments have shown that speakers use duration at constituent boundaries to distinguish potentially ambiguous utterances (Lehiste, Olive, & Streeter, 1976; Cooper, Paccia, & Lapointe, 1978). In part these findings were anticipated by Martin Joos in a 1957 conference (Joos, 1962).

Phrase-final lengthening appears to be the most salient and reliable of the prosodic cues in our misleading intonation sentences. We measured wide-band spectrograms of the sentences from which our misleading intonation stimuli were spliced. In every instance involving the subject-predicate boundary (14 cases), the last syllabic segment before the boundary was longer than that same segment in the same word when it did not precede the major phrase boundary. For example, the vowel of dogs was longer in

(g) Our dogs bark at all the neighborhood cats.

than in

(h) Our dog's bark sometimes frightens people.

(To achieve reliability, we measured the last syllabic segment together with any sonorant consonant which followed it or glide which preceded it. These are customary units in measurements of durations.) Correspondingly, the /ar/ of bark was longer where it preceded the subject-predicate boundary, i.e., in (h) versus (g). In addition, similar

lengthening was apparent in our two remaining pairs of sentences, which involved the boundary between an introductory adverbial clause and the main clause as well as that between the subject and the predicate. Thus nine sentence pairs out of nine showed phrase-final lengthening in 18 comparisons. Treated as a binomial event with a null probability of .5, this result is highly unlikely to have occurred by chance alone ($p < .001$).

Moreover, these differences in duration were long enough that they could serve as primary perceptual cues. In the 14 comparisons of subject versus nonsubject position, the segment at the end of the subject noun was longer by just over 30 milliseconds, on the average, or some 28% of the measured duration. These differences exceed those put forth by Klatt as probable minima for duration to serve as a primary cue, namely, 25 milliseconds or 20% (Klatt, 1976, p. 1219). Also, the observed difference falls high within the range of JND (=just-noticeable differences) suggested by Lehiste for ordinary (nonoptimal) perceptual conditions, namely 10 to 40 msec (Lehiste, 1970, p. 13).

Most importantly, the observed differences in duration appear to have the requisite property of distinguishing between single- and multiple-word subject noun phrases. For example, Goldhor (1976) found that lengthening is greater in the latter type of phrase, even though as Klatt (1976) notes, this is contrary to the general tendency for speakers to produce longer phrases more rapidly. Such a difference appeared in our misleading sample, too, in the two pairs (a) - (f), above, and (i) - (j) below:

(i) If it's cold, lemonade tastes good.

(j) A drink of cold lemonade tastes good.

In these sentences, from which a misleading intonation stimulus was spliced, the final vowel of lemonade was 25% longer in (j) than in (i), i.e., it was longer when it was part of a multiple-word subject.

Thus for at least some of the sentences which we used, phrase-final lengthening is statistically reliable, is large enough to serve as a perceptual cue, and correctly predicts the distinction between single- and multiple-word subjects. In the same sample of sentences, we observed no such differences in the other prosodic features. As expected, there were no pauses at the subject-predicate boundary which we could detect on the spectrograms. As for amplitude, the stressed vowel of the subject noun was not usually the greatest in amplitude within the subject noun phrase. In our 14 comparisons, that vowel was of greater amplitude than any other in the subject noun phrase in only one instance; it was lower in amplitude than some preceding vowel in eight cases and roughly equal to some preceding vowel in the remaining five cases. (We measured relative amplitude from an amplitude section on spectrograms.) Similarly for pitch: On narrow-band spectrograms of the actual misleading intonation sentences, the word marked by the (false) prosodic break typically had a distinct fundamental frequency contour, but it was quite varied. We observed every possible type of contour: fall, rise, fall-rise, rise-fall. Nor was the total amount of frequency change greater than that on other words in the sentence.

We do not suppose that this preliminary evidence, obtained with comparatively crude acoustic measurements of one speaker, settles the

issue of what prosodic cues mark off major constituents. It is entirely possible that more thorough studies using sophisticated measures of speakers under varied conditions, may show that amplitude and fundamental frequency interact with duration. We simply report that phrase-final lengthening was a large and reliable contrast in the sentences that we used to create our misleading intonation stimuli and that no other cue, including lexical category membership, was as reliable.

Alternatives and Implications

An alternative interpretation of our results, suggested to us by Janet Fodor and Kenneth Wexler, is that the children may have viewed their task as a kind of question/answer session, in which, when the target was the subject, the implicit question was, "Who did it?" or something of the sort. Because "he" by itself is not normally the answer to such a question, this interpretation might account for the difficulty of pronouns. This possibility seems to us unlikely. Because of the variety of sentences that we used (see Appendix), it is difficult to compose a single appropriate question, or even a small set of questions, without resorting to a general "topic" question, such as "Who or what is this about?" The problem with the topic question or any other is that it does not account for the relative difficulty of single-word subjects in general; "soup" or "elephants" or "people" are perfectly good answers and yet these were all more difficult for children than multiple-word phrases.

The prosodic account, on the other hand, correctly predicts the increasing difficulty of multiple-word phrases, single-word subjects,

and pronouns; pronouns are most likely to form a single phonological phrase with all or part of the predicate, while single nouns are less so, and multiple-word phrases least so. It is this gradient, together with the effects of misleading intonation, which most directly supports the role of prosody in children's performance. It is noteworthy also that the difficulty of pronouns directly conflicts with the kind of lexical look-up discussed in the first section of this paper. The word "he" at the beginning of a sentence gives unambiguous structural information; it must be a subject noun phrase and indeed, barring "he who ..." relative clauses, it must be the entire subject noun phrase. If children were relying primarily on the syntactic implications of particular lexical items, pronouns should be among the easiest subjects to identify, not the most difficult.

On the other hand, the question answering strategy may account for our results with the predicate phrase. In these cases, the verb phrase corresponds to the word "do" in a question such as "What was he doing?" With appropriate substitution of subjects and auxiliaries ("What should they do?"), such a question can be constructed for each of the sentences in our predicate phrase experiment except for one which has "seems" as a main verb. This interpretation would account for children's tendency to repeat just the verb phrase and for the lack of any effect of pronominal subjects. On our account, it is predictable that children would use different strategies for the subject and the predicate, for the beginning of the predicate is <u>not</u> marked by the kind of prosodic cue which marks the end of the subject. Unless the children assumed that the predicate must be the complement of the subject, they would have

to use a nonprosodic strategy to identify it.

The Walrus/Alligator repetition task does not directly reflect comprehension, as we have emphasized. Instead, it may involve a degree of metalinguistic judgment, or at least performance should be facilitated by some syntactic awareness. Nevertheless, we think that the task, as performed by children and most adults, involves a rather low degree of explicit analysis of structure. The children, certainly, lacked any grammatical training and could not have named the constituent they were repeating. Surprisingly few of the university undergraduates could do so correctly when asked, either, saying for instance, "I never was much good at that sort of thing [grammar]."

At the other extreme from metalinguistic analysis, the task might have elicited too shallow an approach, in which the listener/repeater dealt only with phonological phrases. We think that children's (and adults') partial success with single-word subjects, misleading intonation, and predicates all suggest that their analysis is not merely superficial. They do not simply repeat the first word or blindly follow the intonation pattern. Indeed, our listeners' partial success with subject phrases that were quite varied in syntax and semantics suggests that they did not adopt various other conceivable ad hoc strategies.

In fact, the task of isolating and repeating constituents can be seen in some everyday linguistic performances. For instance, "echo" questions like, "the professor on a motorcycle?" (= "Did you say, 'the professor on a motorcycle'?") and proform questions like "The professor on a motorcycle did WHAT?" as well as self-corrections often involve manipulating a major constituent. These performances provide

a natural analog to this experimental task; they also provide one kind of evidence from which constituent structure could be learned.

With the advantage of hindsight and discussion, we would now modify these studies in certain ways, primarily by testing more plausible nonconstituents, if possible; by controlling more deliberately the prosodic cues and their interaction, and by presenting a greater variety of predicates, including predicated adjectives, so that do is not an adequate paraphrase. There are interesting possible extensions of the technique, as well. We plan to present pronouns in a referential context, so that they are semantically more like lexical nouns. Also, the use of embedded clauses would make it possible to contrast such constituents as "first subject" with "main clause subject." To test the suggested developmental difference in parsing strategies, it is important to try to extend the technique to younger children.

Comparison to Children's Spelling

In previous work, one of us (Read, 1975) has analyzed the spelling of children in the preschool years and the primary grades. He found certain patterns of nonstandard spelling with high frequency; for example, children tend to use the letter A to represent the vowel of bet as often as 50% of the time overall. In explanation of such patterns, Read hypothesized that children tend to spell alike those speech sounds which they perceive as similar, thus choosing for /ɛ/ the letter which is a standard spelling for /e/ and /æ/. These latter vowels are indeed phonetically similar to /ɛ/; together they occupy the low front quadrant of the vowel space in English, whether "vowel space"

is defined acoustically or articulatorily. In support of this hypothesis, Read put forth several kinds of evidence: that children make other pairings of sounds with spellings (including other vowels) which can be explained by the same principle, that even children who do distinguish /ɛ/ from /æ/ in both production and perception nevertheless use the A spelling, and that nonspelling kindergarten children reveal a perception of these vowel relationships in certain judgmental tasks. Additional evidence of the spelling patterns and their place in a developmental sequence has come from several investigators, working in diverse dialect regions (Beers, 1975; Chomsky, 1971, 1975; Gentry, 1977). The hypothesis that these spellings derive from children's assuming that similar sounds should receive similar spellings has three lines of support: the spellings themselves, the phonetic similarities, and the elicited similarity judgments.

The relationship between this work on spelling and the present research is this: In both cases children appear to be relying on superficial phonetic cues for relatively abstract judgments, namely, for categorizations of speech sounds (for spelling purposes) and segmentation of sentences (in the Walrus/Alligator task). The children involved were of approximately the same age, the age at which they enter school and encounter formal instruction in the written language and other tasks demanding an awareness of language. In addition, the phonetic cues which appear to be salient in each case are outside the awareness of most adults so that the children's behavior seems obscure. For instance, no literate adult would think of BAT as a plausible or even explicable spelling for bent, though such spellings are quite common.

Nevertheless, the principle that children of this age rely on superficial properties of speech sounds when judgments are required is quite natural. When they enter school, their primary, often nearly exclusive, experience of the language has been with its spoken form. They are unaware of the more abstract bases for adult judgments, such as the sound-spelling correspondences and, more basically, the morphological and historical relationships which underlie English spelling. Similarly, in segmenting sentences into constituents, children may be less inclined to rely on lexical categorization and more likely to look for superficial signals. In both kinds of performance, children in the early school years appear to assume that information relevant to segmentation and categorization will be available superficially. We suggest that language development during the school years involves moving toward reliance on more abstract categories and relations.

A Relation to Reading

The relationship between children's spelling and their identification of constituents is not merely that both are metalinguistic tasks, to a degree. In addition, both may be related to reading and writing. Speculating, we suggest that children's reliance on prosodic cues in identifying constituents may relate to a particular hurdle in learning to read.

A substantial portion of beginning readers have difficulty in comprehending what they read, even when they can identify ("decode") the individual words, and even when they could comprehend the same sentence if it were spoken or read aloud. Such readers are known as "word

callers"; they name the words in the text but fail to comprehend. Interestingly, teachers traditionally use the child's prosodic pattern as a tacit diagnostic tool; when the reading has a list intonation, the teacher suspects that the child does not understand and begins to ask comprehension questions.

Comprehension difficulties of this sort are exactly what one would predict, if indeed children rely on prosodic cues in their comprehension of speech. That is, if we are correct that children relied heavily on duration as a cue to constituent structure in our Walrus/Alligator paradigm, and if indeed they use a similar strategy in speech comprehension, then comprehension difficulties ought to arise in beginning reading, for prosodic cues such as duration are not systematically preserved in written language. Punctuation preserves some such information: Periods at the ends of sentences, commas after introductory clauses, and various marks around parenthetical modifiers indirectly correspond to structural information signalled prosodically in speech. But other sentence-internal structure is not represented, including embedded clauses, such as complements and (restrictive) relatives, and the subject-predicate boundary.

Admittedly, we are speculating here. We know of no evidence that links this particular kind of reading difficulty with speech comprehension strategies and with prosodic cues in particular. However, the existence of this difficulty in beginning reading is consistent with our results and with extending these results to comprehension in general. Indeed, if one were to speculate a bit further, one might even suppose that one reason adults were able to deal with misleading and, for single-

word subjects, missing prosodic cues is that they had learned to read. A parallel change takes place in judgments of phonetic relationships. While children recognize genuine phonetic similarities (Read, 1975), adults tend to suppose that the sounds which are similar are those which are spelled alike, such as the vowels of wide and width, even though phonetically these vowels are almost as different as they could be. At any rate, studying the possible relationship between comprehension strategies and reading has potentially great significance; it is a direction in which current psycholinguistics may ultimately make a practical contribution.

Conclusion

Methodologically, these Walrus/Alligator studies illustrate a way of testing the accessibility of various surface (and perhaps nonsurface) constituents, without requiring overt grammatical analysis. The technique may be appropriate for younger ages than judgments of relatedness, as in Levelt (1970), for instance. We think it constitutes a reasonably natural way of asking children to isolate constituents, in order to study the interaction of various kinds of cues.

Substantively, these studies indicate that major surface constituents are accessible, more so than nonconstituents. They suggest that prosodic cues, particularly phrase-final lengthening, aid listeners in picking out the subject phrases of sentences, and that children rely on such cues more heavily than adults, even when categorial information is unambiguous.

As a result, children have greater difficulty in identifying short

subject phrases; pronouns are especially inaccessible, but only when the task is to identify a constituent, rather than the first word. This gradient, from multiple-word subject phrases, to single-word subjects, to pronouns is just what one would predict if children tend to rely on prosodic cues such as duration in identifying the subject noun phrase.

References

Beers, J. W. First- and second-grade children's developing orthographic concepts of tense and lax vowels (Doctoral dissertation, University of Virginia, 1974). Dissertation Abstracts International, 1975, 35, 4972-A. (University Microfilms No. 75- 4694)

Bever, T. G. The cognitive basis for linguistic structures. In J. R. Hayes (Ed.), Cognition and the development of language. New York: John Wiley, 1970.

Chomsky, C. S. Invented spelling in the open classroom. Word, 1971, 27, 499-518.

Chomsky, C. S. How sister got into the grog. Early Years, 1975, 6, pp. 36-39; 78-79.

Clark, H. H., & Clark, E. V. Psychology and language. New York: Harcourt Brace Jovanovich, 1977.

Cooper, W. E., Paccia, J. M., & Lapointe, S. G. Hierarchical coding in speech timing. Cognitive Psychology, 1978, 10, 154-177.

de Villiers, J. G., & de Villiers, P. A. Early judgments of semantic and syntactic acceptability by children. Journal of Psycholinguistic Research, 1972, 1, 299-310.

Fodor, J. A., Bever, T. G., & Garrett, M. F. The psychology of language: An introduction to psycholinguistics and generative grammar. New York: McGraw-Hill, 1974.

Garrett, M. F. Word perception in sentences. In R. Held, K. Taeuber, & H. Liebowitz (Eds.), Perception: Handbook of sensory physiology (Vol. 8). Berlin: Springer Verlag, 1978.

Gentry, J. R. A study of the orthographic strategies of beginning readers. Unpublished doctoral dissertation, University of Virginia, 1977.

Gleitman, L. R., & Gleitman, H. Phrase and paraphrase: Some innovative uses of language. New York: W. W. Norton, 1970.

Gleitman, L. R., Gleitman, H., & Shipley, E. The emergence of the child as grammarian. Cognition, 1972, 1, 137-164.

Goldhor, R. Sentential determinates of duration in speech. Unpublished Master's dissertation, Massachusetts Institute of Technology, 1976.

Joos, M. The definition of juncture and terminals. In Second Texas conference on problems of linguistic analysis in English. Austin: The University of Texas, 1962.

Kimball, J. P. Seven principles of surface structure parsing. Cognition, 1973, 2, 15-47.

Klatt, D. H. Vowel lengthening is syntactically determined in a connected discourse. Journal of Phonetics, 1975, 3, 129-140.

Klatt, D. H. Linguistic uses of segmental duration in English: Acoustic and perceptual evidence. Journal of the Acoustic Society of America, 1976, 59, 1208-1221.

Langendoen, D. T. Essentials of English grammar. New York: Holt, Rinehart, & Winston, 1970.

Lehiste, I. Suprasegmentals. Cambridge, Mass.: M.I.T. Press, 1970.

Lehiste, I., Olive, J. P., & Streeter, L. A. Role of duration in disambiguating syntactically ambiguous sentences. Journal of the Acoustic Society of America, 1976, 60, 1199-1202.

Levelt, W. J. M. A scaling approach to the study of syntactic relations. In G. B. Flores d'Arcais & W. J. M. Levelt (Eds.), Advances in psycholinguistics. Amsterdam: North-Holland Publishing, 1970.

Martin, J. G. On judging pauses in spontaneous speech. Journal of Verbal Learning and Verbal Behavior, 1970, 9, 75-78.

Massaro, D. W. Understanding language: An information-processing analysis of speech perception, reading, and psycholinguistics. New York: Academic Press, 1975.

Read, C. Children's categorization of speech sounds in English. Urbana, Ill.: National Council of Teachers of English, 1975.

Appendix

Sentences Used in Experiments

I. Subject Noun Phrase

1. The doctor carefully pulled the long splinter out.
2. My older sister should take piano lessons.
3. John and his friends were studying dinosaurs.
4. A very large piece of pie will fill you up.
5. Most of the parents sat together.
6. The store on the corner sells penny candy.
7. All our cabbages and bean plants have died.
8. One of my favorite aunts always bakes cookies for me.
9. The little old lady is knitting a sweater.
10. My father's cab arrived at the airport exactly on time.
11. His new puppy has run away.
12. The girl in the red dress is crying.
13. The first and second graders will be eating late today.
14. The most important guests arrived late.
15. Two of the girls have seen Star Wars.
16. My best friend and I are selling lemonade.
17. He turned down my last offer.
18. Some children in my neighborhood don't have skateboards.
19. That man with the beautiful dog is blind.
20. We entered the spooky old house through the window.

II. Predicate Phrase

1. A clown was leading the parade.
2. They should put their shoes on.
3. The air-conditioner kept him cool.
4. We have been working hard.
5. The boy upstairs can run very fast.
6. That mean dog will bite her.
7. I traded bicycles with Bill.
8. She opened the box carefuliy.
9. One student brought an apple for the teacher.
10. Some kids finish fast enough.
11. The boys were playing outside.
12. Santa Claus must put his belt on carefully.
13. Our neighbor seems very angry.
14. Everyone was laughing at my sister.
15. My father is working on the car.
16. This winter we will ride our sled.

III. Last Word Subject - First Word Predicate

1. Every day a very large plane lands at the airport.
2. The farmer's tractor broke down.
3. The little baby cried.
4. It will be dark outside tonight.
5. My brother and sister are watching TV.
6. My friends gave some toys to Alice.
7. That poor little kitten in the garden seems hungry.
8. Some kids don't like school.
9. Ghosts come out after dark.
10. Something very heavy crashed to the floor.
11. The house and the barn were painted last week.
12. Some kids in my school like radishes.
13. All my friends went to the game.
14. The leaves on our big tree are turning red.
15. He didn't walk home.
16. Most policemen are very helpful.
17. The lost and found box is near my classroom.
18. The kindergarten teacher took it away from me.

IV. Single Word Subject

1. My favorite aunt always bakes cookies for me.
2. His new puppy has run away.
3. A large piece of pie will fill you up.
4. The first and second graders will eat late today.
5. Two of the girls have seen Star Wars.
6. Most of the parents sat together.
7. The little old lady is knitting a sweater.
8. My father's cab arrived at the airport on time.
9. John and his friends were studying dinosaurs.
10. The doctor carefully pulled the long splinter out.

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11. Toys were lying everywhere after the party.
12. Soup tastes good on a cold day.
13. A bright flash of lightning lit up the sky.
14. We may be going to Milwaukee next month.
15. The old grey barn finally collapsed.
16. Elephants can squirt people with their trunks.
17. Soap will melt away to nothing in hot water.
18. My whole family is going to Disneyland next year.
19. He could not answer all my questions.
20. People usually brush their teeth in the morning.
21. Two of my friends have been on television recently.
22. Ghosts come out after dark.
23 Bees sting people in the garden.

V. Misleading Intonation

1. My favorite aunt always bakes cookies for me.
2. His new puppy has run away.
3. A large piece of pie will fill you up.
4. The first and second graders will eat late today.
5. Two of the girls have seen Star Wars.
6. Most of the parents sat together.
7. The little old lady is knitting a sweater.
8. My father's cab arrived at the airport on time.
9. John and his friends were studying dinosaurs.
10. The doctor carefully pulled the long splinter out.

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11. Your neighbors shovel their sidewalk carefully.
12. Our dog's bark sometimes frightens people.
13. Brand new babies can't sit up by themselves.
14. A drink of cold lemonade tastes good.
15. Too much candy will make you sick.
16. The government spies on foreign agents.
17. The new teacher's watch has stopped.
18. The old clock in the hallway was ticking loudly.
19. Trainers of wild animals are brave.
20. The best season passes so quickly.
21. My brother and I were fixing it.
22. The young student guards don't carry rifles.
23. Most farmers milk their cows in the morning.